In the Claims:

Please amend claim 1.

The claims are as follows:

1. (Currently Amended) A method of fabricating a gate dielectric layer, comprising:

forming a silicon dioxide layer on a top surface of a substrate;

placing said substrate in a first chamber having a first inlet ~~first~~ port and a second inlet port;

generating a plasma in a second chamber, said plasma comprising at least one nitridation species, said second chamber adjacent to said first chamber, said second chamber connected to said first chamber by said first inlet ~~first~~ port in said first chamber;

transferring said nitridation species of said plasma from said second chamber to said first chamber through said first inlet port; and

performing a plasma nitridation in said first chamber using said nitridation species in a reducing atmosphere to convert said silicon dioxide layer into a silicon oxynitride layer.

2. – 3. (Canceled)

4. (Previously Presented) The method of claim 32, wherein said inert gas is helium and said reducing gas is hydrogen, ammonia, a mixture of hydrogen and nitrogen, a mixture of ammonia and nitrogen or a mixture of hydrogen, ammonia and nitrogen.

5. (Canceled)

6. (Previously Presented) A method of fabricating a gate dielectric layer, comprising:

providing a substrate;

forming a silicon dioxide layer on a top surface of said substrate;

performing a plasma nitridation in a reducing atmosphere to convert said silicon dioxide layer into a silicon oxynitride layer;

wherein the step of performing a plasma nitridation is performed using plasma comprising nitrogen, an inert gas and a reducing gas; and

wherein said inert gas is helium and said reducing gas is hydrogen.

7. (Original) The method of claim 1, wherein said substrate includes a bulk silicon or silicon on a insulator substrate and said forming a silicon dioxide layer is formed by a process selected from the group consisting of native oxide growth in air or oxygen, thermal oxidation, rapid thermal oxidation, chemical vapor deposition and oxidizing cleaning processes.

8. (Original) The method of claim 1, wherein said silicon dioxide layer has a thickness of about 8 to 23 Å.

9. (Original) The method of claim 1, wherein said silicon oxynitride has a thickness of about 8 to 24 Å.

10. (Original) The method of claim 1, wherein said silicon oxynitride film contains between about 2 and 20 percent nitrogen.

11. (Original) The method of claim 1, wherein the concentration of nitrogen in said silicon oxynitride layer is between about 1E21 and 1E22 atm/cm^3.

12. (Original) The method of claim 1, wherein the step of performing a plasma nitridation imparts a dose of nitrogen in between about 1E14 and 5E14 atm/cm^2 to said silicon dioxide layer.

13. (Original) The method of claim 1, wherein said silicon oxynitride layer has a thickness of about 0 to 35% greater than the thickness of said silicon dioxide layer.

14. (Original) The method of claim 1, wherein the mean thickness of said silicon oxynitride layer varies by no more than about one-half angstrom sigma from a center to an edge of said substrate.

15. (Original) The method of claim 1, wherein the nitrogen concentration of said silicon oxynitride layer varies by not more than about 25% from a center to an edge of said substrate.

16. (Withdrawn) A method of fabricating a MOSFET, comprising:

providing a semiconductor substrate having at least a uppermost silicon layer;

forming a silicon dioxide layer on a top surface of said semiconductor substrate;

performing a plasma nitridation in a reducing atmosphere to convert said silicon dioxide layer into a silicon oxynitride layer;

forming a polysilicon gate on said silicon oxynitride layer aligned over a channel region in said semiconductor substrate; and

forming source/drain regions in said semiconductor substrate, said source drain regions aligned to said polysilicon gate.

17. (Withdrawn) The method of claim 16, wherein the step of performing a plasma nitridation is performed using a remote plasma nitridation process.

18. (Withdrawn) The method of claim 16, wherein the step of performing a plasma nitridation is performed using a nitrogen and an inert gas plasma introduced through a first inlet of a remote plasma nitridation tool and a neutral reducing gas introduced through a second inlet of said remote plasma nitridation tool.

19. (Withdrawn) The method of claim 18, wherein said inert gas is helium and said reducing gas is hydrogen, ammonia, a mixture of hydrogen and nitrogen, a mixture of ammonia and nitrogen and a mixture of hydrogen, ammonia and nitrogen, deuterium, deuterated ammonia, a mixture of deuterium and nitrogen, a mixture of deuterated ammonia and nitrogen, a mixture of deuterium, deuterated ammonia and nitrogen, and a mixture of deuterium, ammonia and nitrogen.

20. (Withdrawn) The method of claim 16, wherein the step of performing a plasma nitridation is performed using plasma comprising nitrogen, an inert gas and a reducing gas.

21. (Withdrawn) The method of claim 20, wherein said inert gas is helium and said reducing gas is hydrogen.

22. (Withdrawn) The method of claim 16, wherein said substrate includes a bulk silicon or silicon on a insulator substrate and said forming a silicon dioxide layer is formed by a process selected from the group consisting of native oxide growth in air or oxygen, thermal oxidation, rapid thermal oxidation, chemical vapor deposition and oxidizing cleaning processes.

23. (Withdrawn) The method of claim 16, wherein said silicon dioxide layer has a thickness of about 8 to 23 Å.

24. (Withdrawn) The method of claim 16, wherein said silicon oxynitride has a thickness of about 8 to 24 Å.

25. (Withdrawn) The method of claim 16, wherein said silicon oxynitride film contains between about 2 and 20 percent nitrogen.

26. (Withdrawn) The method of claim 16, wherein the concentration of nitrogen in said silicon oxynitride layer is between about 1E21 and 1E22 atm/cm^3.

27. (Withdrawn) The method of claim 16, wherein the step of performing a plasma nitridation imparts a dose of nitrogen in between about 1E14 and 5E14 atm/cm^2 to said silicon dioxide layer.

28. (Withdrawn) The method of claim 16, wherein said silicon oxynitride layer has a thickness of about 0 to 35% greater than the thickness of said silicon dioxide layer.

29. (Withdrawn) The method of claim 16, wherein the mean thickness of said silicon oxynitride layer varies by no more than about one-half angstrom sigma from a center to an edge of said substrate.

30. (Withdrawn) The method of claim 16, wherein the nitrogen concentration of said silicon oxynitride layer varies by not more than about 25% from a center to an edge of said substrate.

31. (Previously Presented) The method of claim 1, further including:

exhausting said second chamber through said first chamber.

32. (Previously Presented) The method of claim 1, further including:

generating a nitrogen, inert gas and reducing gas plasma in said second chamber from nitrogen, an inert gas and a reducing gas; and

transferring said nitrogen, inert gas and reducing gas plasma from said second chamber into said first chamber through said first inlet port of said first chamber.

33. (Previously Presented) The method of claim 32, wherein said inert gas is helium and said reducing gas is deuterium, deuterated ammonia, a mixture of deuterium and nitrogen, a mixture of deuterated ammonia and nitrogen, a mixture of deuterium, deuterated ammonia and nitrogen, or a mixture of deuterium, ammonia and nitrogen.

34. (Previously Presented) The method of claim 32, wherein said inert gas is helium and said reducing gas is hydrogen.

35. (Previously Presented) The method of claim 1, further including:

generating a nitrogen and inert gas plasma in said second chamber from nitrogen and an inert gas;

transferring said nitrogen, inert gas and reducing gas plasma from said second chamber into said first chamber through said first inlet port of said first chamber; and

introducing a neutral reducing gas into said first chamber through said second inlet port of said first chamber.

36. (Previously Presented) The method of claim 35, wherein said inert gas is helium and said reducing gas is hydrogen, ammonia, a mixture of hydrogen and nitrogen, a mixture of ammonia and nitrogen or a mixture of hydrogen, ammonia and nitrogen

37. (Previously Presented) The method of claim 35, wherein said inert gas is helium and said reducing gas is deuterium, deuterated ammonia, a mixture of deuterium and nitrogen, a mixture of deuterated ammonia and nitrogen, a mixture of deuterium, deuterated ammonia and nitrogen, or a mixture of deuterium, ammonia and nitrogen.

38. (Previously Presented) The method of claim 1, wherein said nitridation plasma is generated by radio frequency excitation.